

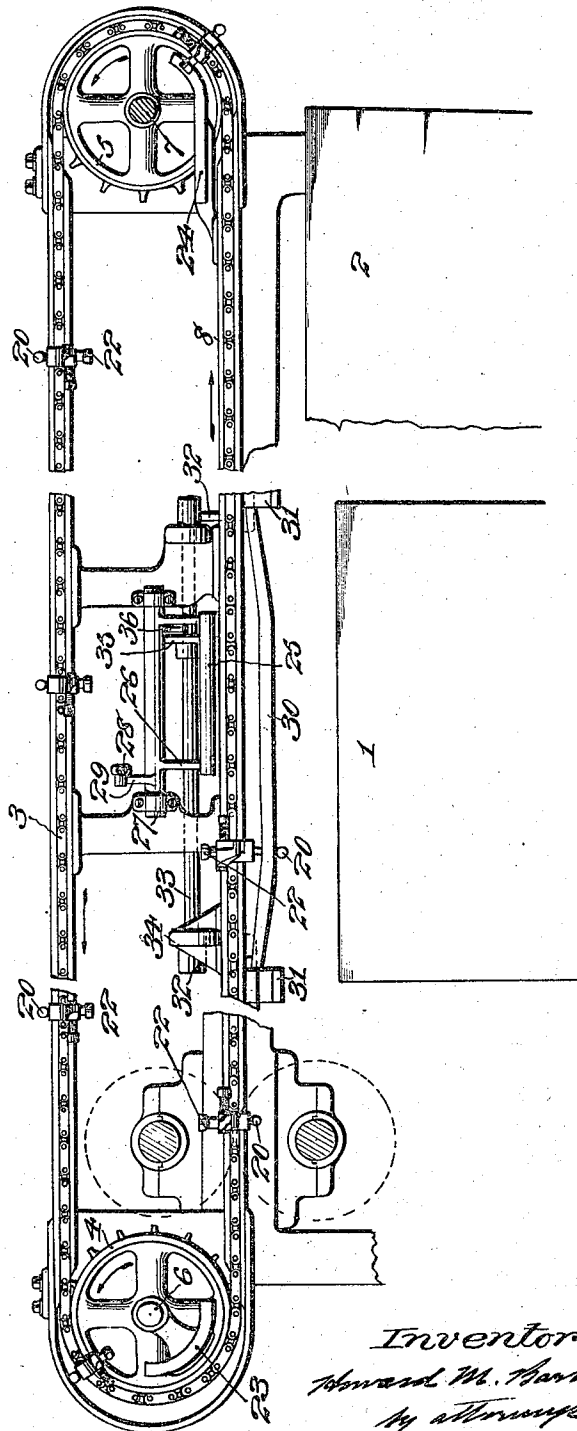
H. M. BARBER.
 DELIVERY MECHANISM FOR PRINTING MACHINES.
 APPLICATION FILED APR. 1, 1921.

1,426,033.

Patented Aug. 15, 1922.

4 SHEETS—SHEET 1.

Fig. 1



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 Howard M. Barber
 by attorney
 Edmund Howard

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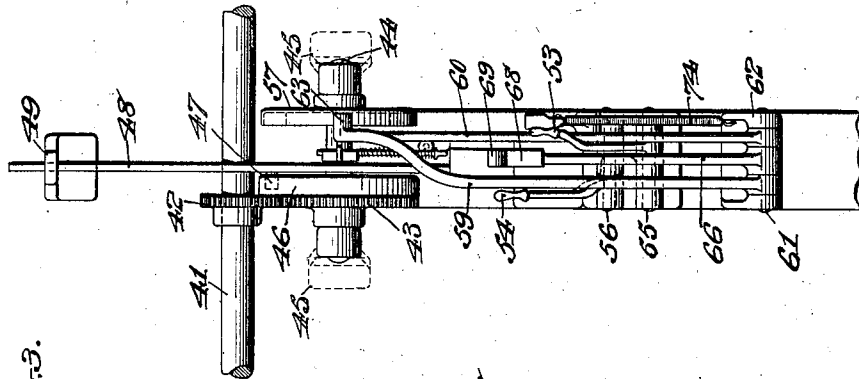


Fig. 3.

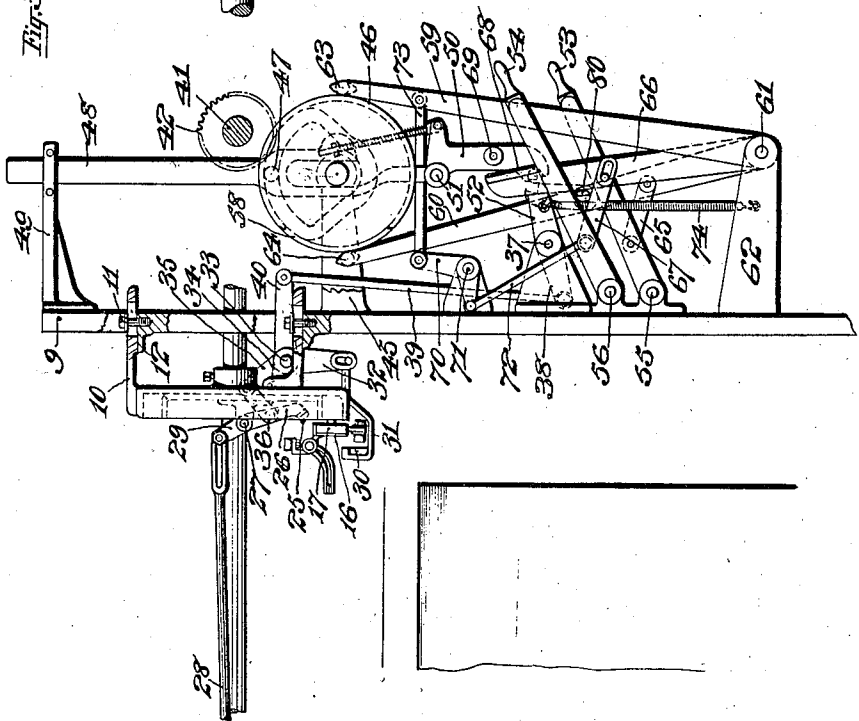
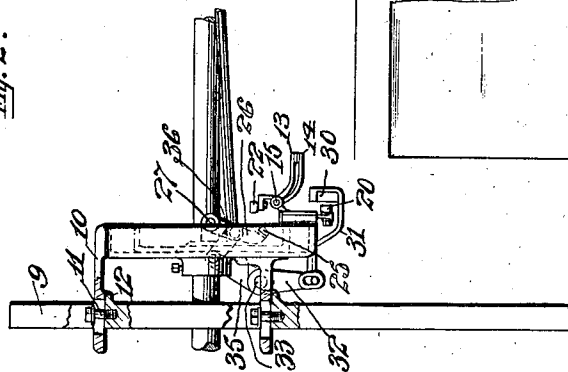


Fig. 2.



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4 SHEETS—SHEET 3.

Fig. 4.

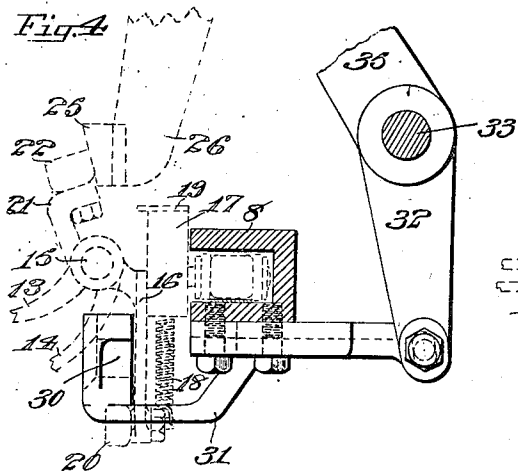


Fig. 5.

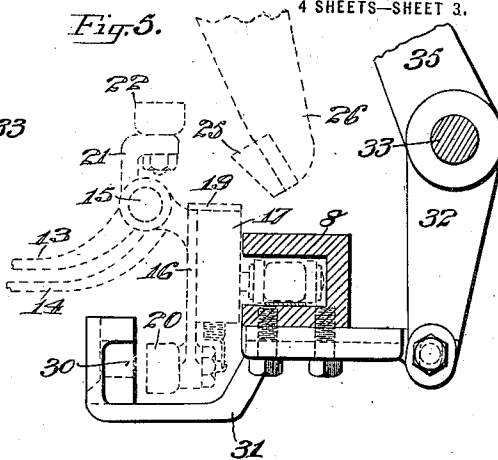


Fig. 6.

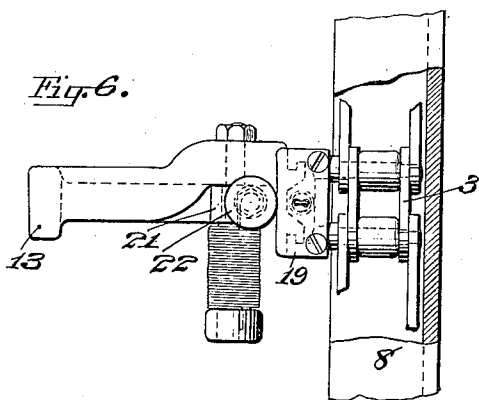


Fig. 7.

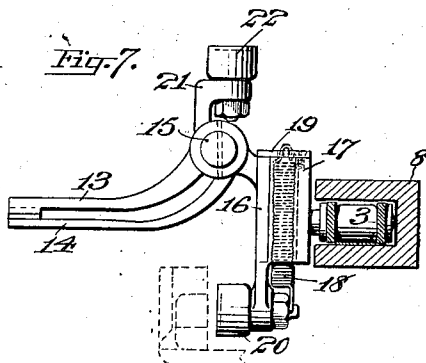
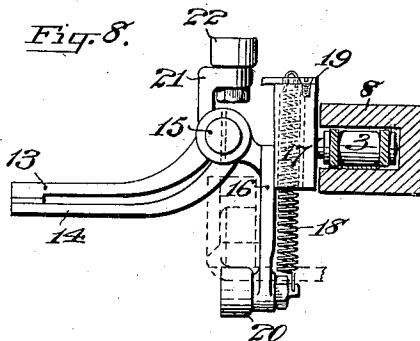


Fig. 8.



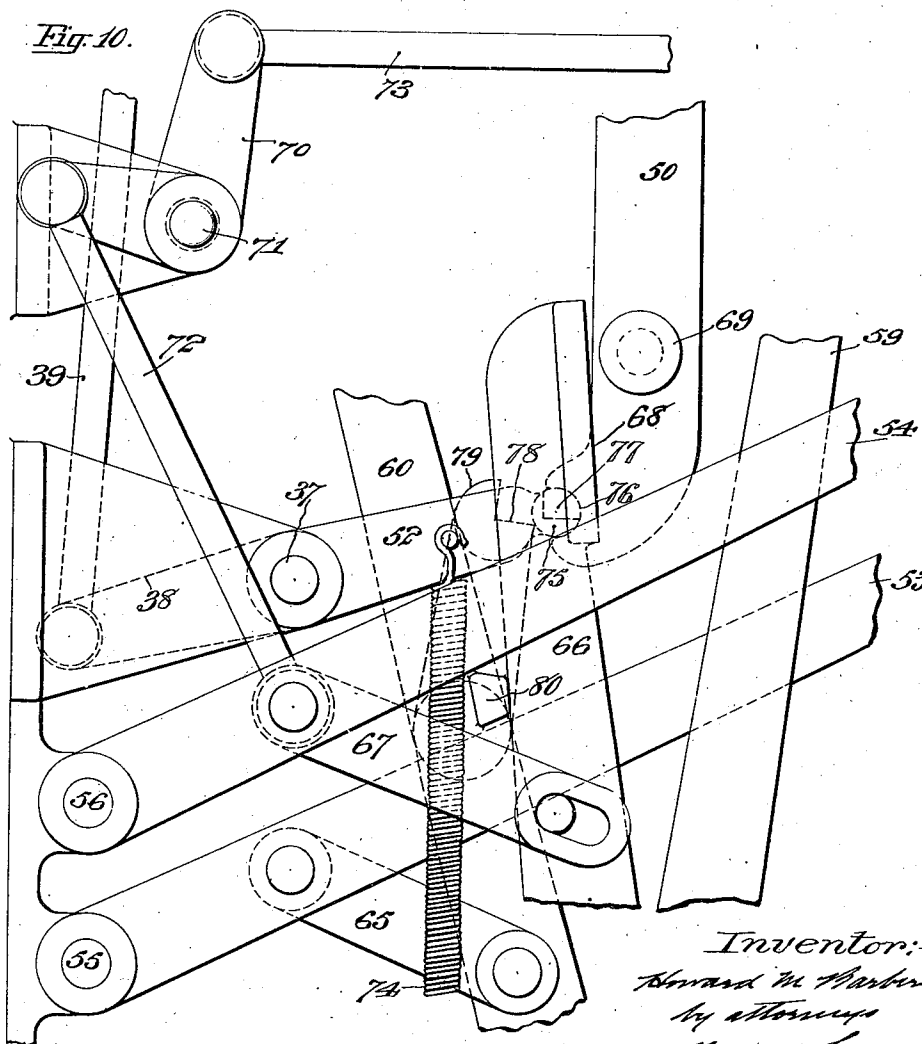
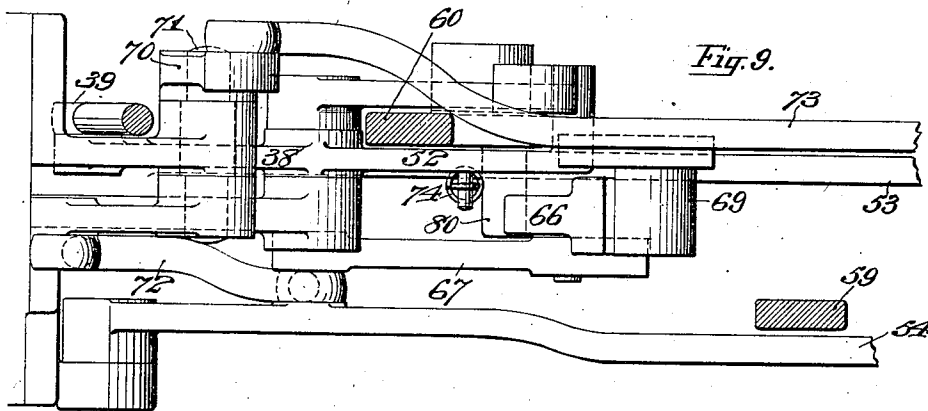
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4 SHEETS—SHEET 4.



Inventor:-
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UNITED STATES PATENT OFFICE.

HOWARD M. BARBER, OF STONINGTON, CONNECTICUT, ASSIGNOR TO C. B. COTTRELL & SONS COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

DELIVERY MECHANISM FOR PRINTING MACHINES.

1,426,033.

Specification of Letters Patent. Patented Aug. 15, 1922.

Application filed April 1, 1921. Serial No. 457,644.

To all whom it may concern:

Be it known that I, HOWARD M. BARBER, a citizen of the United States, and resident of Stonington, in the county of New London and State of Connecticut, have invented a new and useful Improvement in Delivery Mechanism for Printing Machines, of which the following is a specification.

In delivery mechanisms where the sheets are delivered alternately to two piles, one ahead of the other, and are brought out and delivered in the same horizontal plane, there is more or less trouble experienced in carrying sheets for the second pile over the top of the first pile. When the piles are small there is less trouble but as the pile increases in height, the sheets "crowd", making the piles much higher in the center than at the edges, due to the fact that the air does not escape as quickly from the centers of the piles as it does from the edges. The center of the first pile therefore soon projects up into the path of travel of the sheets so that the sheets for the second pile will be dragged across the freshly printed top sheet of the first pile, and thereby cause a smear. If there is any static electricity, it will cause the sheets to cling together, thereby causing a disarrangement of the sheets of the first pile and an interference with the delivery of the sheets of the second pile.

One object of my invention is to provide means whereby the sheets for the first pile will be delivered at a lower level than the sheets for the second pile, means being provided for carrying the sheets intended for delivery to the first pile to a lower level than the sheets intended for delivery to the second pile.

Another object of my invention is to provide means whereby the opposite side grippers of the delivery carrier and their carrying and operating means may be adjusted toward and away from the center of the machine for handling sheets of different widths.

My invention includes automatic means for conveying alternate sheets through different paths for delivery to different piles, and manually controlled means for causing any number of next succeeding sheets to be conveyed along either path and delivered to either pile as may be desired.

A practical embodiment of my invention

is represented in the accompanying drawings, in which,

Fig. 1 represents the endless delivery carrier in longitudinal vertical section.

Fig. 2 represents a detail end view of the same, together with a side view of the mechanisms for controlling the movement and operation of the side grippers of the endless delivery carrier.

Fig. 3 represents an end view of said side gripper controlling mechanisms.

Fig. 4 represents a detail section on an enlarged scale showing one of the movable cams for depressing the side grippers, in its inoperative position, for permitting the side grippers to travel along their normal path.

Fig. 5 represents a similar view with one of the side gripper depressing cams shown in its operative position for directing the side grippers through their lower path.

Fig. 6 represents a detail plan view of one of the side grippers, its carrier side chain and track.

Fig. 7 represents one of the side grippers in side elevation in its upper position, its carrier side chain and track being represented in cross section.

Fig. 8 represents a similar view with the side gripper in its lower position.

Fig. 9 represents on an enlarged scale a horizontal section showing the side gripper controlling mechanisms.

Fig. 10 represents a detail side view of the same on an enlarged scale.

1 designates the lower first pile and 2 represents the higher second pile. The side chains 3 of the endless delivery carrier pass around their respective front and rear sprocket wheels 4 and 5, which sprocket wheels are laterally adjustable on their cross shafts 6 and 7 respectively. Any well known or approved means (not shown herein) may be employed for driving the endless carrier at a predetermined speed. These side chains 3 of the endless carrier are arranged to travel in their respective endless tracks 8, supported from the side frames 9 of the machine. These endless tracks and their side chains are adjustable toward and away from the center of the machine. In the present instance, I have shown this adjustment as being provided for by means of laterally extended branches 10 of the tracks 8 which may be adjustably secured,

as for instance by bolts 11 to suitable shelves or brackets 12 of the side frames 9.

Each set of side grippers comprises the upper and lower jaws 13 and 14, pivoted at 15 to a movable member 16, vertically slidable in a relatively fixed member 17 carried by one of the links of the side chain. A spring 18 tends to hold the movable member 16 at the limit of its upward movement against a stop 19. This vertically movable member 16 of the side grippers is provided at its lower end with a stud or roller 20.

The movable lower jaw 14 of the side grippers is provided with an uprising arm 21 which carries a stud or roller 22.

The cams for actuating the pairs of side grippers to take all of the sheets at one point and to deliver certain of the sheets or all of the sheets, as may be desired, onto the second pile are stationary, while the cams which are used for operating the pairs of side grippers to deposit certain of the sheets or all of the sheets, as may be desired, onto the first pile, are movable. In the normal running of the delivery mechanism, the movable cams are mechanically operated to control the path and operation of every other pair of grippers. The fixed cams for operating all of the pairs of grippers by engaging their studs or rollers 22, to take the sheets are denoted by 23. The fixed cams for operating the pairs of side grippers by engagement with the studs or rollers 22, for delivery onto the second pile, are denoted by 24.

The laterally movable cams for engagement with the studs or rollers 22 to actuate the pairs of side grippers to deposit the sheets onto the first pile are denoted by 25 and they are carried by the depending arms 26 of rock levers pivoted at 27 to the tracks 8. The depending arm 26 of the cam on one side of the machine is adjustably connected by a cross rod 28 to the uprising arm 29 of the cam carrying lever at the other side of the machine so that the two cams 25 are actuated simultaneously.

The longitudinally disposed cam bars 30 are simultaneously movable laterally into and out of the paths of the studs or rollers 20, carried by the vertically movable members 16 of the side grippers. In the present instance each of these cam bars 30 is provided with two laterally extended arms 31, slidably engaged with the underside of the chain tracks, which arms are connected to depending arms 32 fixed to a longitudinally disposed rock shaft 33, mounted in suitable bearings 34. Uprising arms 35 fixed to the rock shafts 33 are connected by links 36 to the depending arms 26 of the levers which carry the laterally movable gripper actuating cams 25.

It will thus be seen that the cams 25 and cam bars 30 are simultaneously actuated.

The cam bars 30 are so shaped that they will, when moved into the paths of the studs or rollers 20, first draw the movable members 16 downwardly to bring the grippers 13, 14, into a lower level than their normal level. The grippers will then be actuated while traveling along the cam bars 30 to deposit the sheet onto the lower first pile 1. The grippers will then be permitted to lift as they travel off from the cam bars to bring the grippers back into their normal upper path. The rocking movement of the shafts 33 is controlled by a two armed lever pivoted at 37 to one of the side frames 9, one arm 38 of which is connected by a rod 39 to an arm 40, fixed to the adjacent rock shaft 33.

A rotary shaft 41 is provided with a pinion 42 which drives a gear 43 fast on a short shaft 44, mounted in suitable brackets 45, carried by the adjacent side frame 9. This cam shaft 44 is provided with a box cam 46, the groove of which engages a stud or roller 47 carried by a vertically movable cam bar 48, the upper end of which is guided in a bracket 49, carried by the adjacent side frame 9.

A gab hook 50 is pivoted at 51 to the lower end of the cam bar 48, which gab hook is arranged to be brought into and out of locking connection with the arm 52 of the lever pivoted at 37 for controlling the movement of the cams 25—25 and 30—30.

Hand levers 53, 54 are pivoted at 55, 56 to the adjacent side frame 9.

A second cam 57 is mounted on the shaft 44, the flange of which cam is provided with a cut-away portion 58. Cam controlled levers 59, 60 are independently pivoted at 61 on a bracket 62 carried by the adjacent side frame 9. These levers 59, 60 are respectively provided with studs or rollers 63, 64 which engage the mutilated flange of the cam 57.

The hand lever 53 has a toggle joint connection through a link 65 with the cam controlled lever 60. The hand lever 54 has a toggle joint connection with a lever 66 through a link 67. The lever 66 is provided with a track 68 at its free end, arranged under certain conditions to engage a stud or roller 69 on the gab hook 50.

The hand lever 54 is also connected to the cam controlled lever 59, through a bell crank lever 70, pivoted at 71 to the adjacent side frame 9, and the connecting rods 72 and 73 respectively.

A spring 74 leads from the bracket 62 to the arm 52 of the lever 38, 52. The arm 52 of this lever is provided with a stud 75 arranged to be engaged by the recess 76 of the gab hook 50. This arm 52 is also provided with a projection 77 arranged under certain conditions to be engaged by the recess 78 in the free end of a lever 79, carried by the

cam controlled lever 60. The lever 60 is provided with a lug 80 arranged to engage the back of the lever 66 under certain circumstances.

5 Under normal circumstances in the running of the delivery mechanism, the pairs of cams 25 and 30 are operated to engage every other pair of side grippers for directing every other sheet to the first pile and delivering the same thereon.

10 When it is desired to deliver every sheet to the first pile, the pairs of cams 25 and 30 are held permanently in their operative position as follows:—

15 When the break 58 in the cam 57 comes opposite the stud or roller 63 on the lever 59, the lever 54 can be depressed, thus swinging the stud or roller 63 into the inside of the cam 57, through the bell crank lever 70 and the connections 72, 73. At the same time the depression of the hand lever 54 will swing the lever 66 outwardly through the toggle link 67 to cause the track 68 of the lever 66 to engage the stud or roller 69 of the gab hook 50 and thus swing the recess 76 of the gab hook away from the lug 75 of the rock lever 38, 52, thereby permitting the spring 74 to act to swing the said lever 38, 52 to move the pairs of cams 25, 30 to their operative positions and hold the same in the said operative positions so long as the hand lever 54 is depressed. It will be understood that as the gab hook is raised and lowered through the cam bar 48 and cam 46, the stud or roller 69 will travel back and forth on the track 68 of the lever 66.

35 When it is desired to deliver every sheet to the second pile, the pairs of cams 25, 30 are held permanently in their inoperative position as follows:—

40 When the break 58 in the cam 57 comes opposite to the stud or roller 64 of the lever 60, the hand lever 53 may be depressed. This depression of the hand lever 53 will swing the lever 60 in a direction to move the stud or roller 64 into the interior of the cam 57. This is accomplished through the toggle link 65. At the same time the projection 80 on the lever 60 will be caused to engage the back of the lever 66 to swing it in a direction to cause its track 68 to engage the stud or roller 69 on the gab hook to move the gab hook out of its interlocked engagement with the arm 52 of the lever 38, 52. Simultaneously the lever 79, carried by the cam operated lever 60 will be swung to cause its recessed end 78 to engage the projection 77 on the arm 52 of the lever 38, 52, thus holding the lever 38, 52 with its arm 38 depressed. This position of the arm 38 will, through its connections 39, 40, etc., hold the pairs of cams 25, 30 permanently in their inoperative position.

65 It will be noted that the toggle link 67 has a lost motion connection with the lever 66

so as to permit the outward movement of the lever 66 by the engagement of the projection 80 of the lever 60 therewith, to disengage the gab hook from the arm 52 of the lever 38, 52.

70 It is to be understood that when both of the hand levers 53, 54 are in their normally raised position, the pairs of cams 25, 30 will be operated to act on every other pair of sheet grippers, which is a normal action of the delivery mechanism for delivering alternate sheets to the first and second piles.

From the above description it will be seen that all of the sheets may be delivered to the first pile as long as may be desired; or all of the sheets may be delivered to the second pile as long as may be desired; or the sheets may be delivered alternately to both piles as long as may be desired. By this arrangement, the second pile may be filled up to the required extent so that the top of the first pile will be below the top of the second pile.

It will also be seen that when either pile is filled it may readily be removed, by directing all of the sheets to the other pile.

It will also be seen that the side grippers, their chains and tracks and the controlling cams may be bodily moved toward and away from the center of the machine to adapt the mechanisms, for sheets of different widths, this being accomplished without disturbing the relative positions of the parts at each side of the machine and without disturbing their connection with the mechanisms for controlling the operation of the cams for operating the grippers to deliver the sheets onto the first pile.

It is evident that various changes may be resorted to in the construction, form and arrangement of the several parts without departing from the spirit and scope of my invention; hence I do not wish to limit myself to the particular embodiment herein shown and described, but

What I claim is:—

1. In a sheet delivery mechanism, an endless delivery carrier having a series of sets of grippers operable to take all of the sheets at the same point, and means for automatically causing certain of the sets of grippers to travel in different paths for conveying and delivering sheets to different piles.

2. In a sheet delivery mechanism, an endless delivery carrier having a series of pairs of side grippers operable to take all of the sheets at the same point, and means for automatically causing certain of the pairs of grippers to travel in different paths for conveying and delivering sheets to different piles.

3. In a sheet delivery mechanism, an endless delivery carrier having a series of sets of grippers operable to take all of the sheets at the same point, and means for automati-

cally causing alternate sets of grippers to travel in different paths for conveying and delivering sheets to different piles.

4. In a sheet delivery mechanism, an endless delivery carrier having a series of pairs of side grippers operable to take all of the sheets at the same point, and means for automatically causing alternate pairs of grippers to travel in different paths for conveying and delivering sheets to different piles.

5. In a sheet delivery mechanism, an endless delivery carrier having a series of sets of grippers operable to take all of the sheets at the same point, means for automatically causing certain of the sets of grippers to travel in different paths for conveying and delivering sheets to different piles, and manually controlled means for causing any number of next succeeding sets of grippers to travel in either of the paths for conveying and delivering any number of next succeeding sheets to either of said piles.

6. In a sheet delivery mechanism, an endless delivery carrier having a series of pairs of side grippers operable to take all of the sheets at the same point, means for automatically causing certain of the pairs of grippers to travel in different paths for conveying and delivering sheets to different piles, and manually controlled means for causing any number of next succeeding sets of grippers to travel in either of the paths for conveying and delivering any number of next succeeding sheets to either of said piles.

7. In a sheet delivery mechanism, an endless delivery carrier having a series of sets of grippers operable to take all of the sheets at the same point, means for automatically causing alternate sets of grippers to travel in different paths for conveying and delivering sheets to different piles, and manually controlled means for causing any number of next succeeding sets of grippers to travel in either of the paths for conveying and delivering any number of next succeeding sheets to either of said piles.

8. In a sheet delivery mechanism, an endless delivery carrier having a series of pairs of side grippers operable to take all of the sheets at the same point, means for automatically causing alternate pairs of grippers to travel in different paths for conveying and delivering sheets to different piles, and manually controlled means for causing any number of next succeeding sets of grippers to travel in either of the paths for conveying and delivering any number of next succeeding sheets to either of said piles.

9. In a sheet delivery mechanism, an endless delivery carrier having a series of sets of grippers operable to take all of the sheets at the same point, and means arranged to automatically cause certain of the sets of grippers to travel along a lower path for conveying and delivering certain of the

sheets to the first pile, and to automatically cause the remaining sets of grippers to travel along an upper path for conveying the other sheets over the first pile and delivering them to the second pile.

10. In a sheet delivery mechanism, an endless delivery carrier having a series of sets of grippers operable to take all of the sheets at the same point, and means arranged to automatically cause alternate sets of grippers to travel along a lower path for conveying and delivering alternate sheets to the first pile, and to automatically cause the remaining sets of grippers to travel along an upper path for conveying the other sheets over the first pile and delivering them to the second pile.

11. In a sheet delivery mechanism, an endless delivery carrier having a series of pairs of side grippers operable to take all of the sheets at the same point, and means arranged to automatically cause certain of the pairs of grippers to travel along a lower path for conveying and delivering certain of the sheets to the first pile and to automatically cause the remaining pairs of grippers to travel along an upper path for conveying the other sheets over the first pile and delivering them to the second pile.

12. In a sheet delivery mechanism, an endless delivery carrier having a series of pairs of side grippers operable to take all of the sheets at the same point, and means arranged to automatically cause alternate pairs of grippers to travel along a lower path for conveying and delivering alternate sheets to the first pile, and to automatically cause the remaining pairs of grippers to travel along an upper path for conveying the other sheets over the first pile and delivering them to the second pile.

13. In a sheet delivery mechanism, an endless delivery carrier having a series of sets of grippers operable to take all of the sheets at the same point, means arranged to automatically cause alternate sets of grippers to travel along a lower path for conveying and delivering alternate sheets to the first pile, and to automatically cause the remaining sets of grippers to travel along an upper path for conveying the other sheets over the first pile and delivering them to the second pile, and manually controlled means for causing any number of next succeeding sets of grippers to travel along either of the said paths to convey and to deliver their sheets to either of said piles as may be desired.

14. In a sheet delivery mechanism, an endless delivery carrier having a series of sets of grippers operable to take all of the sheets at the same point, means arranged to automatically cause alternate sets of grippers to travel along a lower path for conveying and delivering alternate sheets to the first pile, and to automatically cause the

remaining sets of grippers to travel along an upper path for conveying the other sheets over the first pile and delivering them to the second pile, and manually controlled means

for causing any number of next succeeding sets of grippers to travel along either of the said paths to convey and deliver their sheets to either of said piles as may be desired.

15. In a sheet delivery mechanism, an endless delivery carrier having a series of pairs of side grippers operable to take all of the sheets at the same point, means arranged to automatically cause certain of the pairs of grippers to travel along a lower path for conveying and delivering certain of the sheets to the first pile and to automatically cause the remaining pairs of grippers to travel along an upper path for conveying the other sheets over the first pile and delivering them to the second pile, and manually controlled means for causing any number of next succeeding sets of grippers to travel along either of the said paths to convey and deliver their sheets to either of said piles as may be desired.

16. In a sheet delivery mechanism, an endless delivery carrier having a series of pairs of side grippers operable to take all of the sheets at the same point, means arranged to automatically cause alternate pairs of grippers to travel along a lower path for conveying and delivering alternate sheets to the first pile, and to automatically cause the remaining pairs of grippers to travel along an upper path for conveying the other sheets over the first pile and delivering them to the second pile, and manually controlled means for causing any number of next succeeding sets of grippers to travel along either of the said paths to convey and deliver their sheets to either of said piles as may be desired.

17. In a sheet delivery mechanism, an endless delivery carrier having a series of pairs of side grippers, fixed cams for operating the pairs of grippers at their taking point and at the delivery point for one pile, and coacting automatically movable cams for causing certain of the pairs of grippers to travel in a different path and to operate the grippers while in said different path to deliver their sheets to another pile.

18. In a sheet delivery mechanism, an endless delivery carrier having a series of pairs of side grippers, fixed cams for operating the pairs of grippers at their taking point and at the delivery point for one pile, and coacting automatically movable cams for causing alternate pairs of grippers to travel in a different path and to operate the grippers while in said different path, to deliver their sheets to another pile.

19. In a sheet delivery mechanism, an endless delivery carrier having a series of pairs

of side grippers, fixed cams for operating the pairs of grippers at their taking point and at the delivery point for one pile, and coacting automatically movable cams for causing certain of the pairs of grippers to travel in a different path and to operate the grippers while in said different path to deliver their sheets to another pile, and manually operated means for controlling the action of the movable cams whereby any number of next succeeding sheets may be delivered to either pile.

20. In a sheet delivery mechanism, an endless delivery carrier having a series of pairs of side grippers, fixed cams for operating the pairs of grippers at their taking point and at the delivery point for one pile, and coacting automatically movable cams for causing alternate pairs of grippers to travel in a different path and to operate the grippers while in said different path, to deliver their sheets to another pile, and manually operated means for controlling the action of the movable cams whereby any number of next succeeding sheets may be delivered to either pile.

21. In a sheet delivery mechanism, an endless delivery carrier having side chains, pairs of side grippers carried thereby, interconnected movable cams for controlling the path and operation of the side grippers, a rocking lever operatively connected to said cams, and means for controlling the movement of the rocking lever.

22. In a sheet delivery mechanism, an endless delivery carrier having side chains, pairs of side grippers carried thereby, interconnected movable cams for controlling the path and operation of the side grippers, a rocking lever operatively connected to said cams, and a cam operated gab hook arranged to be locked to the rocking lever for operating it.

23. In a sheet delivery mechanism, an endless delivery carrier having side chains, pairs of side grippers carried thereby, interconnected movable cams for controlling the path and operation of the side grippers, a rocking lever operatively connected to said cams, a cam operated gab hook arranged to be locked to the rocking lever for operating it, a manually operated lever for releasing the gab hook, and spring means to cause the rocking lever when released to move into position to hold the movable gripper controlling cams in their operative position.

24. In a sheet delivery mechanism, an endless delivery carrier having side chains, pairs of side grippers carried thereby, interconnected movable cams for controlling the path and operation of the side grippers, a rocking lever operatively connected to said cams, a cam operated gab hook arranged to be locked to the rocking lever for operating it, and a manually operated lever for releasing the gab hook to cause the rocking lever when released to move into position to hold the movable gripper controlling cams in their operative position.

leased to hold the movable gripper controlling cams in their inoperative position.

25. In a sheet delivery mechanism, an endless delivery carrier having side chains, pairs
5 of side grippers carried thereby, interconnected movable cams for controlling the path and operation of the side grippers, a rocking lever operatively connected to said cams, a
cam operated gab hook arranged to be locked
10 to the rocking lever for operating it, a manually operated lever for releasing the gab hook, spring means to cause the rocking le-

ver when released to move into position to hold the movable gripper controlling cams in their operative position, and a second 15 manually operated lever for releasing the gab hook to cause the rocking lever when released to hold the movable gripper controlling cams in their inoperative position.

In testimony that I claim the foregoing as 20 my invention, I have signed my name this 28th day of March, A. D. 1921.

HOWARD M. BARBER.